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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/560,628	04/28/2000	Julian A. Fells	537-1016	3607

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EXAMINER

LEE, JOHN D

ART UNIT PAPER NUMBER

2874

DATE MAILED: 03/18/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/560,628

Applicant(s)

FELLS ET AL.

Examiner

John D. Lee

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-35 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-23 and 25-35 is/are rejected.
- 7) ☒ Claim(s) 24 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 April 2000 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

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The four (4) sheets of drawing filed with this application on April 28, 2000, are objected to by the Examiner as they include combinations of blue and black ink, and thus will not reproduce sufficiently for patent publication. Acceptable formal drawings must be filed in response to this Office action. This requirement will not be held in abeyance.

Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim 24 is objected to under 37 CFR § 1.75(c) as being in improper form because a multiple dependent claim cannot depend from any other multiple dependent claim. See MPEP § 608.01(n). Accordingly, the claim has not been further treated on the merits.

The following is a quotation of the second paragraph of 35 U.S.C. § 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 22, 23, 34, and 35 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Line 1 of these four claims refers to "*the* dispersion compensating waveguide" or "*the* waveguide" (implying only one waveguide). However, the claims from which these four claims depend make it clear that there are a *number* (plural) of dispersion compensating waveguides. The reference to only one such waveguide, then, is unclear and confusing and the claims are, accordingly, indefinite. It is suggested that the word "the" in the phrases in question be changed to "each" in order to overcome this problem.

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The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-20 and 25-32 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent 6,317,539 to Loh et al. Loh et al discloses a "multiple chirped Bragg grating" device that can adapted for use in many applications, among which are compensation for both dispersion and dispersion slope of optical transmission fibers. As seen, for example, in Figure 7B, the Loh et al device utilizes a four port optical circulator wherein one port is coupled to one chirped Bragg grating unit and an adjacent port is coupled to another chirped Bragg grating unit, with the remaining two ports coupled respectively to an optical input and an optical output. In accordance with the teachings of Loh et al, a chirped Bragg grating unit can comprise a number of chirped Bragg gratings arranged to compensate dispersion (that is, they apply linear dispersion compensation across a signal band); and a chirped Bragg grating unit can comprise a number of chirped Bragg gratings arranged to compensate dispersion slope (that is, they apply nonlinear dispersion compensation across a signal band). It is believed that a person of ordinary skill in the art would have found it obvious, in Loh et al, to include the dispersion compensation unit in one branch coupled to the four-port circulator (reference Figure 7B), and to include the dispersion slope compensation unit in an adjacent branch coupled to the four-port circulator. The resultant device would be the same as the device being claimed by applicant. Note that each chirped Bragg

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grating unit of Loh et al includes a number of chirped Bragg gratings, each having different characteristics (wavelength periodicity, dispersion slope, etc.) which is the same arrangement as in applicant's claimed device. It would certainly be obvious to have such characteristics centered about a pivotal point positioned near the center of a desired signal band. Although the term "quadratic" does not appear in the Loh et al reference, the chirped Bragg gratings therein clearly encompass quadratically chirped gratings. The circulator-based arrangement of Loh et al is designed for reflective-type Bragg gratings, but the use of transmissive-type Bragg gratings would not change the principles involved, it would simply entail additional transmission paths for return of light to the circulator. Therefore, the use of transmissive-type Bragg gratings in Loh et al would have been obvious. The method of using the dispersion compensation device of Loh et al, taking into account the immediately preceding discussion, would obviously be the same as the method being claimed (note that the claimed method limitations correspond to the claimed device limitations).

Claims 21-23 and 33-35 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent 6,317,539 to Loh et al in view of U.S. Patent 6,486,993 to Kuroshima. It is known in the art that a series of individually tailored dispersion compensating optical fibers can be used in the same manner as a series of individually tailored chirped Bragg gratings to accomplish dispersion compensation and/or dispersion slope compensation in an optical transmission system (see Figure 2 of Kuroshima). In accordance with this knowledge, and in view of the ready availability of individually tailored dispersion compensating optical fibers, it would have been obvious

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to utilize the principles espoused by Loh et al wherein the chirped Bragg grating units thereof are replaced by a series of individually tailored dispersion compensating optical fibers. Only ordinary skill in the art would be involved. Such individually tailored dispersion compensating optical fibers would encompass fibers made of different materials, including photonic crystal materials, and would encompass single mode or higher order mode type optical fibers.

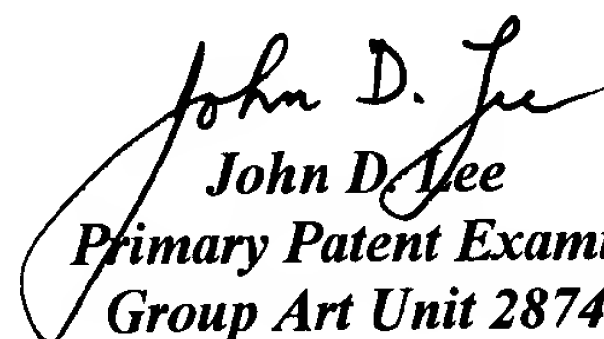
The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Other dispersion compensating devices using serially arranged Bragg gratings can be seen in the cited references to Cao et al, Xie et al, Kohnke et al, Painchaud, and Riant et al.

The filing of an Information Disclosure Statement on October 12, 2000, is acknowledged (note the attached copy of form PTO-1449). No copies of any of the cited documents, however, accompanied this filing. The cited references have thus **not** yet been considered by the Examiner.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. § 103(a), the Examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR § 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the Examiner to consider the applicability of 35 U.S.C. § 103(c) and potential 35 U.S.C. §§ 102(e), (f) or (g) prior art under 35 U.S.C. § 103(a).

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Any inquiry concerning the merits of this communication should be directed to Examiner John D. Lee at telephone number (703) 308-4886. The Examiner's normal work schedule is Tuesday through Friday, 6:30 AM to 5:00 PM. Any inquiry of a general or clerical nature (i.e. a request for a missing form or paper, etc.) should be directed to the Technology Center 2800 receptionist at telephone number (703) 308-0956, to the technical support staff supervisor (Team 2) at telephone number (703) 308-3072, or to the Technology Center 2800 Customer Service Office at telephone number (703) 306-3329.

  
**John D. Lee**  
**Primary Patent Examiner**  
**Group Art Unit 2874**